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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/577,189	02/21/2007	Kevin E. Gates	7603 P 008	1203

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CHICAGO, IL 60606-5096

EXAMINER

BROWN JR, NATHAN H

ART UNIT	PAPER NUMBER
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2121

MAIL DATE	DELIVERY MODE
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10/09/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/577,189

Applicant(s)

GATES, KEVIN E.

Examiner

Nathan H. Brown, Jr.

Art Unit

2121

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE (3) MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 April 2006.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 April 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- ☐ Notice of Informal Patent Application
- ☐ Other: _____

Examiner's Detailed Office Action

1. This Office is responsive to application 10/577,189, filed April 25, 2006.
2. Claims 1-18 have been examined.

Objections to the Claims

3. Claims 1, 7, and 13 are objected to because of the following informalities: "minimised" should be --minimized--. Appropriate correction is required.

Claim Rejections - 35 USC § 101

4. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

5. Claims 1-6, 7-12, and 13-18 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. mathematical abstraction and/or algorithm.
Independent claims 1, 7, and 13 recite a: method for operating a computational device as a support vector machine, computer software product including a computer readable medium for execution by one or more processors of a computer system, and computational device (respectively):

to define a decision surface separating two opposing classes of a training set of vectors, the method including the steps of: associating a distance parameter with each vector of the training set, the distance parameter indicating a distance from its associated vector to the opposite class; and determining a linearly independent set of support vectors from the training set such that the sum of the distances associated with the linearly independent support vectors is minimized.

Clearly, the steps used “to define a decision surface separating two opposing classes of a training set of vectors” recite the 101 judicial exceptions of mathematical abstraction and algorithm.

Independent claims 1, 7, and 13 are not considered to recite a practical application or recite an abstract idea which, as employed, is embodied in, operates on, transforms, or otherwise involves *another* class of statutory subject matter. Claims 2-6, 8-12, and 14-18 depend from claims 1, 7, and 13 without curing the deficiency of the independent claims. Therefore, claims 1-6, 7-12, and 13-18 are considered to be non-statutory under 35 U.S.C. 101.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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7. Claims 1, 7, and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Fung et al. (Fung)*, "Minimal Kernel Classifiers", 2002 in view of *Cluster Analysis (CA)*, "Cluster Analysis", 2001.

Regarding claim 1. *Fung* teaches a method for operating a computational device as a support vector machine (*see* p. 314, 5. Computational Results, 'All our computations were performed on the University of Wisconsin Data Mining Institute "locopl" Windows NT machine using MATLAB 6 (MATLAB, 1994-2001).') in order to define a decision surface separating two opposing classes of a training set of vectors (*see* Fig. 1 and p. 305, "The linear separating surface is the plane $x'w = \gamma$, (3) midway between the bounding planes (2).", *Examiner interprets A- and A+ to be two opposing classes of a training set of vectors.*); and determining a linearly independent set of support vectors from the training set such that the sum of the distances associated with the linearly independent support vectors is minimized (*Examiner asserts the inherency of minimization of the sum of the distances between vectors in clusters such that the minimal distance between the vectors in the different clusters is maximized (i.e., those vectors on the optimal separating hypersurface inherent to support vector machines).*).

Regarding claim 7. *Fung* teaches a computer software product including a computer readable medium for execution by one or more processors of a computer system (*see* p. 314, 5. Computational Results, 'All our computations were performed on the University of Wisconsin Data Mining Institute "locopl" Windows NT machine using MATLAB 6 (MATLAB, 1994-

2001).'), the software product including: instructions to define a decision surface separating two opposing classes of a training set of vectors (see Fig. 1 and p. 305, "The linear separating surface is the plane $x'w = \gamma$, (3) midway between the bounding planes (2).", *Examiner interprets A- and A+ to be two opposing classes of a training set of vectors.*); instructions to determine a linearly independent set of support vectors from the training set such that the sum of the distances associated with the linearly independent support vectors is minimized (*Examiner asserts the inherency of minimization of the sum of the distances between vectors in clusters such that the minimal distance between the vectors in the different clusters is maximized (i.e., those vectors on the optimal separating hypersurface inherent to support vector machines).*).

Regarding claim 13. *Fung* teaches a computational device configured to define a decision surface separating two opposing classes of a training set of vectors, the computational device including one or more processors (see p. 314, 5. Computational Results, 'All our computations were performed on the University of Wisconsin Data Mining Institute "locopl" Windows NT machine using MATLAB 6 (MATLAB, 1994-2001).', *Examiner interprets A- and A+ to be two opposing classes of a training set of vectors. Examiner interprets a "Windows NT machine" to be a computational device including one or more processors.*) arranged to: and determine a linearly independent set of support vectors from the training set such that the sum of the distances associated with the linearly independent support vectors is minimized (*Examiner asserts the inherency of minimization of the sum of the distances between vectors in clusters such that the minimal distance between the vectors in the different clusters is maximized (i.e., those vectors on the optimal separating hypersurface inherent to support vector machines).*).

Fung does not teach the method including the steps of: associating a distance parameter with each vector of the training set, the distance parameter indicating a distance from its associated vector to the opposite class. However, *CA* does teach the method including the steps of: associating a distance parameter with each vector of the training set, the distance parameter indicating a distance from its associated vector to the opposite class (*see* "SINGLE LINKAGE CLUSTERING"). It would have been obvious at the time the invention was made to persons having ordinary skill in the art to combine *Fung* with *CA* to arrange a set of case into a cluster so that cases within a cluster are more similar to each other than they are to cases in other clusters.

Correspondence Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nathan H. Brown, Jr. whose telephone number is 571-272- 8632. The examiner can normally be reached on M-F 0830-1700. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Anthony Knight can be reached on 571-272-3687. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status

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information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



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Nathan H. Brown, Jr.
September 30, 2007